

**BY ORDER OF THE COMMANDER
SHAW AFB**

SHAW AIR FORCE BASE INSTRUCTION

48-148

16 DECEMBER 2014

Aerospace Medicine

RADIATION SAFETY PROGRAM



COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-Publishing website for downloading or ordering at www.e-publishing.af.mil.

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: 20 AMDS/SGPB

Certified by: 20 AMDS/CC
(Lt Col Theresa Goodman)

Pages: 19

This instruction implements Air Force Instruction (AFI) 48-148, *Ionizing Radiation Protection*. This instruction provides guidance, procedures, precautionary measures, and responsibilities for the control of radioactive materials (RAM) and radiation-producing devices. This instruction incorporates AFI 40-201, *Managing Radioactive Materials in the US Air Force*; Air Force Occupational Safety Health (AFOSH) Standard 48-9, *Electro-Magnetic Frequency (EMF) Radiation Occupational Health Program*; AFOSH Standard 48-139, *Laser Radiation Protection Program*; and Air Force Manual (AFMAN) 48-125, *Personnel Ionizing Radiation Dosimetry*. It applies to all activities conducted on Shaw Air Force Base (SAFB) to include its tenant units as well as contractors who possess, use, handle, or store sources of radiation within the SAFB installation. This instruction requires collecting and maintaining information protected by the Privacy Act of 1974 authorized by Title 10, U.S.C., Section 8013, *System of Records notice F033, Privacy Act Request Files*, applies. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>. Contact supporting records managers as required. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using Air Force (AF) Form 847, *Recommendation for Change of Publication*; route AF Forms 847s to 20 AMDS/SGPB, 431 Meadowlark St, Bldg. 1005, Shaw AFB SC 29152; route through your appropriate functional chain of command.

1.	Objective:	3
2.	Responsibilities:	3
3.	Non-ionizing Radiation:	6
4.	Ionizing Radiation:	8
5.	RAM Permits:	9
6.	RAM Receipt or Shipment:	10
7.	RAM Storage:	10
8.	RAM Movement on SAFB:	10
9.	RAM Disposition:	11
Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION		12
Attachment 2—NON-AIR FORCE USE OF RADIATION SOURCES APPLICATION REQUIREMENTS		15
Attachment 3—BASIC RAM SHIPPING PROCEDURES		19

1. Objective: This instruction describes the Radiation Safety and “As Low as Reasonably Achievable” (ALARA) Programs for SAFB. It requires control of Radioactive Materials (RAM) and radiation-producing devices to safeguard the health of military and civilian populations, while permitting maximum benefits from their use. The effectiveness of these programs depends on consistent and conscientious safety efforts of the material/device users.

2. Responsibilities:

2.1. The Commander, 20 FW/CC:

2.1.1. IAW AFIs 40-201 and 48-148, AFOSH Standards 48-9 and 48139, and AFMAN 48-125, the 20 FW/CC has designated members of the 20 AMDS/SGPB Bioenvironmental Engineering (BE), as the Installation Radiation Safety Officers (IRSOs) and Laser Safety Officers (LSOs) (both herein known as IRSO).

2.2. The Commander, 20 MDG/CC will:

2.2.1. Provide the IRSO, BE, Aerospace Medicine, and Optometry Clinics the resources necessary to carry out provisions in this instruction.

2.2.2. Through the SAFB IRSO, advise tenant unit commanders on radiological health and safety.

2.3. All 20 FW Commanders will:

2.3.1. Ensure unit personnel who receive, possess, distribute, use, transfer, or dispose of RAM observe the requirements of this instruction, federal, local, and United States Air Force (USAF) policies and regulations.

2.3.2. Appoint in writing a radiation safety officer if their unit or workplace uses and/or possesses radioactive material or radiation-producing devices. Send copy of the following appointment letters to 20 AMDS/SGPB:

2.3.2.1. RAM Permit Radiation Safety Officer (PRSO), as required by AFI 40-201 and AFI 48-148. The PRSO must be a member of the using organization, and meet education and experience requirements in AFI 40-201.

2.3.2.2. Unit Laser Safety Officers (ULSO) for units using or possessing American National Standards Institute (ANSI) Class 3b or 4 lasers.

2.4. The IRSO will:

2.4.1. Initiate, supervise, and execute the 20 FW Ionizing Radiation Safety Program IAW AFIs 40-201 and 48-148, AFOSH Standards 48-9 and 48-139.

2.4.2. Act as central point of contact for all requests to use RAM or radiation-producing devices, including those by contractors.

2.4.3. Provide the following in support of the 20 FW Ionizing Radiation Safety Program:

2.4.3.1. Manage the Thermoluminescent Dosimetry (TLD) Program IAW AFMAN 48-125.

2.4.3.2. Coordinate requests for radioactive waste disposal through USAFSAM/SDRH (Wright-Patterson AFB OH), or recycling through 88 ABW/EM (Wright-Patterson AFB OH).

2.4.4. Investigate the loss, theft, or spill of RAM, and all real or suspected overexposures to radiation IAW AFIs 40-201 and 48-148, AFOSH Standards 48-9 and 48-139 and AFMAN 48-125.

2.4.4.1. In the event of contractor loss or release of RAM, and/or suspected overexposures to ionizing radiation from RAM, the IRSO will report to the USAF Radioisotope Committee (RIC) those portions of the incident that pertain to the AF involvement.

2.4.4.2. The IRSO will ensure the applicability of this instruction is included in all Requests for Proposals and Invitations for Bid, to include requests for equipment, materials and services. The IRSO will work through the contracting officer to ensure use of RAM or equipment containing RAM does not pose harm to the installation population.

2.4.5. Be the sole authority for contacting HQ ACC/SGPB, USAF RIC, or the Nuclear Regulatory Commission regarding reportable events.

2.4.6. The IRSO may be appointed temporarily as PRSO only when the using organization has no one qualified.

2.5. The PRSOs and/or ULSOs:

2.5.1. The PRSOs and/or ULSOs will be the Radiation Safety Officer's (RSOs) single point of contact for their respective materials, devices, and instruments.

2.5.2. Maintain and update an inventory of all RAM, lasers, Generally Licensed Devices (GLDs), and radiation-producing devices, respectively, within the organization. The unit PRSO and/or ULSO must contact the IRSO whenever changes occur.

2.5.3. Coordinate with the IRSO for assistance in developing unit radiation safety training and operating instructions (OIs).

2.5.4. Establish a written unit training program IAW AFI 40-201 and 48-148, AFMAN 48-125 (RAM and ionizing radiation-producing devices), and AFOSH Standards 48-9 (electro-magnetic frequency radiation) and 48-139 (lasers).

2.5.4.1. The goal of the radiation safety awareness training is to ensure exposures are kept ALARA. Document training on each member's AF Form 55, *Employee Safety and Health Record*, or equivalent.

2.5.4.2. Contact BE if you need assistance in conducting radiation safety awareness training.

2.5.5. Understand and enforce the requirements in Attachment 2 of this instruction pertaining to contractors bringing RAM onto SAFB or any of its Geographically Separated Units (GSUs) and tenant organizations.

2.6. Environmental Flight will:

2.6.1. Assist the IRSO with characterizing mixed wastes.

2.6.2. Direct requests for RAM disposal to 20 AMDS/SGPB.

2.7. Flight Medicine will:

2.7.1. Conduct pre-employment and termination medical examinations of civil service employees and Air Force personnel who may be routinely exposed to ionizing radiation.

2.7.2. Examine potentially exposed individuals as soon as practical.

2.7.3. Document all examinations in individual medical records.

2.8. Public Health will assist the IRSO and coordinate medical examinations IAW AFIs 40-201 and 48-148, AFOSH Standards 48-9 and 48-139 and AFMAN 48-125.

2.9. Optometry will:

2.9.1. Conduct baseline and termination eye examinations for personnel working with Class 3b or 4 LASERS IAW AFOSH Standard 48-139.

2.9.2. Document all examinations in individual medical records.

2.10. Workplace Supervisors will:

2.10.1. Protect the health of personnel by ensuring operations involving radiation adhere to all radiation safety instructions, technical orders, and workplace operating instructions (OIs).

2.10.1.1. Ensure deviations from presently approved procedures are coordinated and approved by the IRSO.

2.10.1.2. Coordinate all new and revised OIs, pertaining to radiation safety, with the IRSO prior to publishing.

2.10.2. Conduct and document training on AF Form 55 or equivalent IAW AFIs 40-201, 48-148, AFMAN 48-125, and AFOSH Standards 48-9 and 48-139.

2.10.3. Enforce the TLD Program and ensure personnel wear TLD badges IAW AFMAN 48-125.

2.10.4. Provide all necessary personal protective equipment and ensure their proper use.

2.10.5. Inform the IRSO and PRSO immediately of new radiation sources (i.e. RAM, Generally Licensed Devices (GLDs) or radiation-producing devices (i.e. X-rays, GLD, etc.), or changes to existing sources to ensure all radiation hazards in the workplace are evaluated.

2.10.6. Immediately refer declared pregnant females to Public Health for a pregnancy evaluation.

2.10.7. Report any suspected or alleged overexposures immediately to the IRSO (see AFI 48-148, Chapters 3 and 4 respectively).

2.10.8. Notify the IRSO of unsafe work practices or hazardous conditions involving RAM or radiation-producing devices.

2.11. Individuals/workers will:

2.11.1. Comply with AFI 40-201, 48-148, AFOSH Standards 48-9 and 48-139 and AFMAN 48-125.

2.11.2. Minimize personal exposure to radiation IAW radiation safety training and/or ALARA policy. Follow all safety precautions to ensure exposures to radiation are ALARA (ionizing) or below applicable limits (non-ionizing).

2.11.3. Report incidents of suspected overexposures to the supervisor immediately (see AFI 48-148, Chapters 3 and 4).

2.11.4. Notify the IRSO of any off-duty, non-Air Force radiation work (i.e., in other employment), and provide monitoring results for inclusion in the Master Radiation Exposure Registry.

2.11.5. Individuals on the TLD Program will notify the IRSO before receiving medical diagnostic testing or treatment involving RAM. If you are not on the TLD program, it is not necessary to contact the IRSO.

2.11.6. Declare their condition to their supervisor and Primary Care Manager if they believe they may be pregnant. Pregnant civilian females should declare their condition to their workplace supervisor.

2.11.7. Report to an Occupational Health doctor, Flight Medicine, building 1005, (803) 895-6746, for examination as soon as practical, if they believe they have been exposed to radiation sources.

2.12. CES/CEF, Fire and Emergency Services will:

2.12.1. Ensure the location and characteristics of RAM used or stored on SAFB are properly identified in fire planning and updated as notified by the IRSO.

2.12.2. Ensure fire protection personnel are trained on the hazards associated with radiation sources.

2.12.3. Notify the IRSO and using agency source custodian of fires in facilities with RAM.

2.13. Civil Engineering will:

2.13.1. Ensure the IRSO is consulted on facility designs and modifications that include the storage or use of RAM and/or radiation producing devices such as x-ray machines.

2.13.2. Consult with the IRSO during response operations involving nuclear or radiological materials.

2.14. Packing and Crating or Transportation Management will: Ensure packages are in compliance with Title 49 Code of Federal Regulations (CFR) *Parts* 171 through 199, *Transportation Requirements* and AAFP 24-2, *Preparation and Movement of Air Force Materiel*.

3. Non-ionizing Radiation:

3.1. Electro-Magnetic Frequency (EMF) Radiation.

3.1.1. Unit Commanders will establish a unit EMF safety awareness training program IAW AFOSH Standard 48-9, paragraph 2.13.1. BE shall review the program during its routine shop inspections.

3.1.2. Any incident in which personnel are potentially exposed to EMF in excess of the maximum permissible exposure limit will be immediately reported to the IRSO and 20 AMDS/SGPB, building 1005, (803) 895-6196. Exposure incidents that occur during non-duty hours will be reported to the BE on-call technician at (803) 468-7679, who will then notify the IRSO.

3.1.3. Owning unit commanders must coordinate modification and construction plans for facilities intended for use with operations involving EMF with the IRSO.

3.2. LASER Radiation.

3.2.1. Incidents in which personnel suspect they have been exposed to LASER radiation in excess of the maximum permissible exposure or complaints of persistent visual disturbances after working with LASERS must be reported to the IRSO, 20 AMDS/SGPB, building 1005, (803) 895-6196. Exposure incidents that occur during non-duty hours will be reported to the BE on-call technician at (803) 468-7679, who will then notify the IRSO.

3.2.2. The potentially exposed individuals will report to SAFB clinic for examination as soon as practical. Individuals with suspected skin exposure will also report to SAFB clinic for examination as soon as practical.

3.2.3. Owning unit commanders must coordinate modification and construction plans for facilities intended for use with LASER operations with the IRSO.

3.2.4. Personnel routinely working in a Class 3b or 4 laser environment require baseline eye exams and post employment eye exams IAW AFOSH Standard 48-139. Personnel will schedule an appointment with the 20 AMDS/SGPE Optometry Clinic, (803) 895-6579.

3.3. Ultraviolet (UV) Radiation:

3.3.1. Personnel will not be exposed to occupationally produced UV radiation (e.g., welding arcs, damaged metal halide lamps; non-destructive inspections lamps) in excess of the Threshold Limit Value specified in the most current American Conference of Governmental Industrial Hygienist Threshold Limit Values and Biological Exposure Indices booklet. BE will assist shop supervisors and personnel in identifying areas and conducting surveys where hazards may exist.

3.3.1.1. Workers required to perform duties outdoors for extended periods in the sun are urged to keep skin covered (e.g., long sleeved shirts, hats, etc., consistent with duties and safety requirements) and use sun block on exposed skin.

3.3.2. Incidents in which personnel suspect they have been occupationally exposed to UV radiation or complain of persistent visual disturbances after working with UV must report the incident to the IRSO, 20 AMDS/SGPB, building 1005, (803) 895-6196. Exposure incidents that occur during non-duty hours will be reported to the BE on-call technician at (803) 468-7679, who will then notify the IRSO. Individuals will report to

the SAFB Clinic for medical assistance. Occupationally related sunburns will not be reported to the IRSO.

3.3.2.1. Any applicable unit safety incident reporting procedures will also be followed.

3.3.3. Coordinate modification and construction plans for facilities intended for use with UV radiation operations with the IRSO.

3.4. Non-Air Force organizations, including contractors/subcontractors, who desire to bring a non-ionizing radiation source/device onto SAFB must follow the procedures in Attachment 2.

4. Ionizing Radiation:

4.1. Ionizing radiation exposures must be maintained below limits published in Title 10 CFR Part 20, *Standards for Protection Against Radiation*, AFMAN 48-125, and AFI 48-148, and they will also be kept ALARA. BE will assist shop supervisors and personnel in identifying areas and conducting surveys where ionizing radiation hazards may exist.

4.1.1. Local TLD investigation action levels are determined by the SAFB IRSO. The IRSO will establish these on the basis of dose histories/trends at individual workplaces.

4.2. Personnel involved in radiological operations on SAFB must use all reasonable means available (i.e., time, distance, and shielding) to minimize potential radiation exposure from all ionizing radiation sources (e.g. RAM, GLDs, X-rays).

4.2.1. BE manages the TLD Program for civil service and USAF personnel at SAFB IAW AFMAN 48-125. Personnel enrolled in the TLD Program will receive TLD training from BE prior to performing radiation duties.

4.2.2. Upon initial assignment, personnel assigned to shops enrolled in the TLD Program must contact BE, building 1005, for enrollment in the program and issue of a TLD prior to beginning duties. Contractors are responsible for their own monitoring program. Air Force personnel are not authorized to wear contractors' monitoring devices unless a suitable Air Force monitoring device accompanies the devices.

4.2.3. Personnel will wear and store their TLDs IAW guidelines provided by BE and AFMAN 48-125. Misuse or mishandling of TLDs (medical-legal documentation), intentional or otherwise, will be investigated.

4.3. All personnel working with RAM (both permitted and exempt GLD) must adhere to safe and healthful work practices whenever handling RAM. Obtain additional guidance on safe practices and contamination control from the SAFB IRSO (Reference: AFI 40-201 and AFI 48-148).

4.4. Any incident in which personnel are potentially exposed to ionizing radiation in excess of exposure limits must be immediately reported to the IRSO, 20 AMDS/SGPB, building 1005, (803) 895-6196. Exposure incidents that occur during non-duty hours will be reported to the BE on-call technician at (803) 468-7679, who will then notify the IRSO.

4.4.1. Supervisors must account for all affected personnel and be assembled in an area away from the hazard area. Do not allow personnel to leave the area until cleared by the SAFB IRSO or designated representative. **NOTE:** Record events leading to exposures,

including circumstances, operating parameters, amount and type of isotopes if applicable, names of personnel exposed, where the incident occurred, and an estimate of the extent of contamination (if RAM or GLD is dispersed).

4.4.2. Within 5 working days from the date of the incident, the IRSO must receive a complete written report from the user. The report must contain a detailed description of the incident, a chronological description of how the incident was handled, and preventive measures taken to ensure the incident will not be repeated. Other reporting instructions are detailed in AFI 40-201 and AFI 48-148. The IRSO will communicate with HQ ACC/SGPB and the USAF RIC as necessary. **NOTE:** The USAF RIC makes all required notices to the Nuclear Regulatory Commission (NRC).

4.4.3. Any applicable unit safety incident reporting procedures will also be followed.

4.4.4. New or modified uses of RAM or ionizing radiation-producing devices must be reported to and approved by the IRSO.

4.5. Modifications and construction plans for facilities intended for use with operations involving ionizing radiation or RAM must be coordinated with the IRSO.

4.6. RAM.

4.6.1. Permitted RAM will be handled IAW AFI 40-201.

4.6.2. GLDs will be handled IAW Title 10 CFR Part 31.5, *NRC General License Requirements* and USAF RIC guidance.

4.6.3. The IRSO must ensure all generally licensed devices are leak tested and inventoried IAW Title 10 CFR Part 31.5.

4.6.4. The PRSO must ensure all permitted RAM is leak tested and inventoried IAW the permit conditions.

4.6.4.1. The unit or organization permittee shall retain custodianship, control, receipt, storage, and issue of NRC licensed RAM covered by an AF-held license.

5. RAM Permits:

5.1. Organizations acquiring/using RAM and/or radiation-producing devices through any contracting mechanism (e.g., US Army Corps of Engineers, SABER, GSU, Ops/Maint, contracts etc.) must:

5.2. Comply with AFI 40-201 requirements for non-Air Force use of RAM and radiation-producing devices.

5.2.1. Non-Air Force organizations must send written requests to the IRSO at least 30 calendar days prior to use. At GSUs, contractors will submit this information to the unit supervisor, who will pass it to the IRSO. The request must include the information listed in Attachment 2.

5.2.2. For contractors, these requirements must be included in the statement of work.

5.2.2.1. Contractors will not bring RAM onto SAFB without the written consent of the IRSO.

5.2.2.2. Contractors will present the IRSO with a current permit or license and current leak tests as determined by the permit conditions or Title 10 CFR Part 31.5.

5.3. USAF RAM Permits.

5.3.1. The IRSO will determine if a permit or license is needed before anyone can possess or use RAM on SAFB property.

5.3.2. The requestor must submit applications for permits through the IRSO. The requestor will prepare the application IAW AFI 40-201, paragraph 3.3.2.

5.3.3. Organizations desiring to renew an expiring RAM Permit should contact the IRSO at least 60 days prior to the permit expiration date. Renewal will consist of preparation and submission of a complete, stand-alone application to the USAF RIC.

5.3.4. Organizations with permits no longer requiring the use of RAM should transfer, terminate, or dispose of the material. Transfer, termination, or disposal guidelines are outlined in AFI 40-201, paragraphs 3.7, 3.15 and 3.14 respectively. Contact the PRSO and IRSO for assistance with transfer, termination, or disposal.

6. RAM Receipt or Shipment:

6.1. Shipping and receiving RAM (including GLDs) must be done IAW Title 10 CFR Part 71, *Preparation and Movement of Air Force Materiel* and Title 49 CFR Parts 171 through 199, and AFD 24-2.

6.2. Shipping and receiving procedures are summarized in Attachment 3.

6.3. The IRSO will provide instructions and assistance as needed.

7. RAM Storage:

7.1. Keep all RAM in a RAM storage area or a locked enclosure separate from other items to insure personnel not familiar with RAM are not accidentally exposed to ionizing radiation. Proper storage techniques and labeling requirements are outlined in AFI 40-201 and Title 10 CFR Part 20.

7.2. A storage area from which RAM has been permanently removed must be surveyed by a qualified individual approved by the IRSO. Clearance must be received before the area may be used for other purposes.

8. RAM Movement on SAFB:

8.1. Personnel must account for the location of RAM and prevent the movement of RAM to unauthorized persons, or locations without adequate handling or storage facilities. Notify the IRSO if you plan to move RAM. *Note: The IRSO does not need to be notified when LANTIRN/SNIPER pods are moved to/from an approved storage area for use on an F-16.*

8.1.1. Transport RAM off installation only in adequately shielded and authorized containers per Department of Transportation (DOT) regulations (Title 49 CFR 171-199) and as authorized by the permit.

8.1.2. Vehicles will require the appropriate DOT placards.

8.1.3. All users must have proper survey instruments when transporting RAM. Ask BE for assistance/guidance.

9. RAM Disposition:

9.1. Disposition of licensed/permitted RAM must be coordinated through the IRSO and may only be carried out by transfer to another licensed agency or to a licensed disposal contractor IAW 40-201.

9.2. Disposal of RAM is the responsibility of the using organization. Disposal procedures for Air Force owned RAM are specified in AFI 40-201.

STEPHEN F. JOST, Colonel, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

Title 10 CFR Part 20, *Standards for Protection Against Radiation*

Title 10 CFR Part 31.5, *NRC General License Requirements*

Title 10 CFR Part 71, *Packaging and Transportation of Radioactive Material*

Title 29 CFR 1910.1096, *Occupational Safety and Health Standards - Ionizing Radiation*

Title 49 CFR Parts 171 through 199, *Transportation Requirements*

AFPD 24-2, *Preparation and Movement of US Air Force Materiel*, 27 April 2011

AFI 10-2501, *Air Force Emergency Management (EM) Program Planning and Operations*, 24 January 2007

AFI 40-201, *Managing Radioactive Materials in the USAF*, 16 March 2011

AFI 48-139, *Laser and Optical Radiation Protection Program*, 25 July 2012

AFI 48-148, *Ionizing Radiation Protection*, 21 September 2011

AFI 91-204, *Safety Investigations and Reports*, 24 September 2008

AFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*, 4 October 2011

AFOSHSTD 48-9, *Electro-Magnetic Frequency (EMF) Radiation Occupational Health Program*, 14 December 2011

Prescribed Forms

No prescribed forms are implemented by this publication.

Adopted Forms (Added)

AF Form 55, *Employee Safety and Health Record*

AF Form 190, *Occupational Illness/Injury Report*

AF Form 847, *Recommendation for Change of Publication*

AF Forms 1527, *History of Occupational Exposure to Ionizing Radiation*

Abbreviations and Acronyms

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFOSH—Air Force Occupational Safety and Health

AFRIMS—Air Force Records Information Management System

ALARA—As Low as Reasonably Achievable

ANSI—American National Standards Institute

BE—Bioenvironmental Engineering
DOE—Department of Energy
DOT—Department of Transportation
EMF—Electro-Magnetic Frequency
GLD—Generally Licensed Device
GSU—Geographically Separated Unit
IAW—In Accordance With
IRSO—Installation Radiation Safety Officer
LSO—Laser Safety Officer
NRC—Nuclear Regulatory Commission
OI—Operating Instruction
OPR—Office of Primary Responsibility
PRSO—Permit Radiation Safety Officer
RAM—Radioactive Materials
RDS—Records Disposition Schedule
RIC—Radioisotope Committee
RSO—Radiation Safety Officer
SAFB—Shaw Air Force Base
TLD—Thermoluminescent Dosimeter
ULSO—Unit Laser Safety Officer
USAF—United States Air Force
UV—Ultraviolet

Terms

As Low As Reasonably Achievable (ALARA) Concept—Air Force philosophy for working with ionizing radiation and RAM. Establishes a set of management and administrative actions to ensure radiation doses are minimized to the greatest extent possible.

Generally Licensed Devices (GLD)—A generally licensed item, as defined and listed in Title 10 CFR 31.5, is a device that contains RAM and is used for detecting, measuring, or controlling moisture, density, chemical composition, and level, and for producing light or producing an ionized atmosphere. Examples of these devices include IBIS (Inflight Blade Inspection System) indicators, ice detectors, self-luminous exit signs, gas chromatographs, compasses (with tritium dials), certain fill-level gauges, certain density gauges, certain fixed and portable gauges, certain chemical agent monitors, counterweights, and certain lenses. There are other categories of generally licensed devices defined in Title 10 CFR 31.3, 31.7, 31.8, 31.10, Title 10 CFR 40.13, and Title 10 CFR 40.22.

Ionizing Radiation—Particulates or electromagnetic energy produced from the decay of unstable elements, which may produce ions that interact with matter. Ionizing radiation may also be produced in the form of X-rays. The different types of ionizing radiation include Alpha, Beta, Gamma, X-ray, and most rarely, Neutron radiation.

LASER—Acronym of Light Amplification by Stimulated Emission of Radiation. Lasers, broadly speaking, are devices that generate or amplify light, just as transistors generate and amplify electronic signals at audio, radio, or microwave frequencies.

LASER Safety Officer or Unit LASER Safety Officer (ULSO)—Organization focal point for laser safety and appointed in writing by the unit commander. Must meet requirements specified in AFOSH Standard 48-139.

Permit Radiation Safety Officer (PRSO)—Specified by the RAM Permit and assigned duties IAW AFI 40-201 for the specific permit. Appointed in writing by commander of organization owning RAM Permit.

Radioactive Materials (RAM)—Unstable elements, the decay of which produces ionizing radiation.

Radiation—Producing Devices—Includes ionizing and non-ionizing radiation devices exempt from permits or other regulations under AFI 40-201. Examples are electro-magnetic frequency emitters/antennas and X-ray machines.

Radiation Safety Officer—Individual appointed in writing by the 20 FW Commander responsible for the installation radiation safety program. Must meet requirements specified in AFI 40-201.

RAM Permit—A permit issued by the USAF Radioisotope Committee (HQ AFMSA/SG3PB – Radiation Health, 7700 Arlington Blvd, Falls Church, VA 22042) IAW AFI 40-201 regulating the possession, use, maintenance, and disposal of a non-exempted instrument or items containing RAM (for AF agencies). For non-AF agencies, a permit issued by the Nuclear Regulatory Commission or an agreement state.

Thermoluminescent Dosimeter (TLD)—Badge issued by BE (20 AMDS/SGPB) to monitor personal exposure to ionizing radiation in certain jobs identified as having an exposure risk by the SAFB Radiation Safety Officer.

Unit Device Officer (UDO)—Organization focal point for generally licensed devices and radiation-producing devices appointed in writing by the unit commander. Must meet requirements specified in AFI 48-148 and Title 10 CFR 31.

Attachment 2**NON-AIR FORCE USE OF RADIATION SOURCES APPLICATION REQUIREMENTS****A2.1. Use of RAM:**

A2.1.1. Air Force Instruction 40-201, *Managing Radioactive Materials in the US Air Force*, sets USAF policy for using radioactive materials (RAM). It applies to all civilians, civilian contractors, Department of Defense, Department of Energy (DOE), and DOE prime contractor personnel bringing RAM onto Air Force installations.

A2.1.2. Non-Air Force organizations that bring RAM onto USAF installations, or conduct operations involving RAM on USAF installations, must obtain the approval in writing of the installation commander or his designee. To obtain this approval, an application must be forwarded to the 20 FW Radiation Safety Officer (IRSO), 20 AMDS/SGPB, building 1005, (803) 895-6196, with a courtesy copy to the contracting officer at least 30 calendar days before the planned date for commencement of activities on the installation. Contractors operating at SAFB or Poinsett Weapons Range will forward the following requirements to the IRSO:

A2.1.2.1. A description of the proposed activities on NRC Form 241.

A2.1.2.2. The procedures established to ensure radiological health and safety of Air Force personnel and the public while on Air Force installations; the name, local address, and telephone number for the responsible local representative; and the name, address, and telephone number of the IRSO named on their license.

A2.1.2.3. A current copy of the applicable NRC, or Agreement State License. Expired licenses are unacceptable. To be valid at the installation, the license must either specifically state the installation by name on the license, or state approval for work at temporary job sites anywhere in the United States where the NRC or Agreement State maintains jurisdiction. DOE or DOE prime contractors must provide, in lieu of a license, written certification of their exemption from NRC licensing requirements and cite the applicable exemption of Title 10 CFR.

A2.1.2.4. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work.

A2.1.2.5. An acknowledgement that the IRSO can make periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel and prevent potential contamination of government property. The IRSO must identify deficiencies to the contracting officer for corrective actions. In addition, the IRSO, in coordination with the Chief of the Contracting Office, have authority to suspend contractor operations believed to be unsafe.

A2.1.2.6. Copies of the most recent leak test results (not over 180 days old) for sealed sources.

A2.1.2.7. Copies of training certificates for authorized users.

A2.2. Contractors will adhere to 10 CFR and 49 CFR sections pertaining to transportation of RAM.

A2.3. Contractors must notify the IRSO when RAM arrives on installation, and when the RAM is removed from the installation.

A2.4. Use of LASERs:

A2.4.1. Non-Air Force organizations required to use LASER Classes 3b or 4, on SAFB property must submit a written request for approval at least 30 calendar days before commencement of activities, which require the use of a laser.

A2.4.2. Contractors must submit their request to 20 AMDS/SGPB, building 1005, (803) 895-6196, with a courtesy copy to the contracting officer, and will include:

A2.4.2.1. Description/Characteristics:

A2.4.2.1.1. Manufacturer.

A2.4.2.1.2. Model.

A2.4.2.1.3. Number of same units.

A2.4.2.1.4. Serial numbers.

A2.4.2.1.5. LASER medium.

A2.4.2.1.6. Mode of operation (i.e. continuous wave (CW), single pulse, multiple pulse).

A2.4.2.1.7. Maximum exposure time (train length).

A2.4.2.1.8. Time (sec) & wavelength.

A2.4.2.1.9. Energy/pulse (J) or CW power (W).

A2.4.2.1.10. Pulse repetition frequency.

A2.4.2.1.11. Pulse width.

A2.4.2.1.12. Beam diameter (at 1/e point).

A2.4.2.1.13. Beam divergence (at 1/e point).

A2.4.2.2. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included: where the LASER will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A2.4.2.3. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel.

A2.5. Use of Electro-Magnetic Frequency (EMF) Radiation:

A2.5.1. Non-Air Force organizations required to use equipment generating EMF in excess of 7 watts peak power and a frequency of 100 MHz or greater on SAFB property must submit a written request for approval at least 30 calendar days before commencement of activities, which require the use of the EMF generating device.

A2.5.2. Contractors must submit their requests to 20 AMDS/SGPB, building 1005, (803) 895-6196, with a courtesy copy to the contracting officer; and will include:

A2.5.2.1. Description/Characteristics:

- A2.5.2.1.1. Description.
- A2.5.2.1.2. Nomenclature.
- A2.5.2.1.3. Location of emitters.
- A2.5.2.1.4. Quantity.
- A2.5.2.1.5. Frequency (MHz).
- A2.5.2.1.6. Pulse width (microsecond).
- A2.5.2.1.7. Pulse repetition freq. (pps).
- A2.5.2.1.8. Peak power (kW).
- A2.5.2.1.9. Antenna size (feet--horizontal/vertical).
- A2.5.2.1.10. Antenna band width (degrees--horizontal/vertical).
- A2.5.2.1.11. Antenna gain (dB).
- A2.5.2.1.12. Scan rate (rpm).

A2.5.2.2. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included where the EMF generating device will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A2.5.2.3. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel.

A2.6. Use of Ionizing Radiation Generating Devices:

A2.6.1. Non-Air Force organizations required to use ionizing radiation-producing devices (for RAM, see Section 1) on SAFB must submit a written request for approval at least 30 calendar days before commencement of activities, which require the use of ionizing radiation-producing devices.

A2.6.2. Contractors must submit their request to 20 AMDS/SGPB, building 1005, (803) 895-6196, with a courtesy copy to the contracting officer; and will include:

A2.6.2.1. Description/Characteristics:

- A2.6.2.1.1. X-ray unit manufacturer.
- A2.6.2.1.2. Model number.
- A2.6.2.1.3. Serial number.
- A2.6.2.1.4. Maximum kVp, mA, Sec.
- A2.6.2.1.5. Ionizing radiation source/emitter (electron tube).

A2.6.2.2. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included:

where the ionizing radiation-producing device will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A2.6.2.3. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel.

A2.7. Use of Ultraviolet (UV) Radiation-Producing Devices:

A2.7.1. Non-Air Force organizations required to use UV generating devices, including welders, on SAFB must submit a written request for approval at least 30 calendar days before commencement of activities, which require the use of UV generating devices.

A2.7.2. Contractors must submit their request to 20 AMDS/SGPB, building 1005, (803) 895-6196, with a courtesy copy to the contracting officer; and will include:

A2.7.2.1. Description/Characteristics:

A2.7.2.1.1. Description.

A2.7.2.1.2. Nomenclature.

A2.7.2.1.3. Location of devices.

A2.7.2.1.4. Quantity.

A2.7.2.1.5. Wavelength.

A2.7.2.1.6. Effective Irradiance.

A2.7.2.2. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included: where the UV generating device will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A2.7.2.3. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel.

Attachment 3

BASIC RAM SHIPPING PROCEDURES**A3.1. Basic Ram Shipping Procedures.**

A3.1.1. Each receiving or shipping agency must have a separate, marked, and locked enclosure for the receipt, handling, or shipment of radioactive packages. This separate area is to ensure personnel not familiar with the proper handling of RAM are not accidentally exposed to ionizing radiation. This location must be coordinated with 20 AMDS/SGPB, building 1005, (803) 895-6196.

A3.2.1. All RAM that are covered by a license or permit must be accounted for by a RAM transfer receipt, which is separate from any contractual, security, or other receipt documents. **Contract shipping and receiving agencies should obtain transfer receipts when items are dispensed to SAFB organizations.**

A3.3.1. When RAM is received at, or is to be shipped from SAFB, the IRSO must be contacted by the receiving or shipping agency. The IRSO or designated representative will monitor the container. **NOTE:** IAW Title 10 CFR 20.1906, all packages labeled with a Radioactive White I, Yellow II, or Yellow III, as specified DOT regulations (Title 49 CFR 172.403 and 172.436-440), must be monitored as soon as possible but not later than 3 hours after the package is received. If the package is received after normal duty hours, the package must be surveyed not later than 3 hours from the beginning of the next workday.

A3.3.1.1. If the RAM received is a sealed source, the most recent leak test results must accompany the package, and a copy of these results must be sent to the IRSO. If this test does not accompany the sealed source, an individual approved by the IRSO performs the leak test before the item is placed into use. Current leak test results must accompany sealed sources shipped from SAFB.

A3.3.1.2. Once the package has been monitored and cleared by an individual approved by the IRSO, contact the user or custodian and transport the material directly to the user or custodian. If the user or custodian cannot be located, store the RAM until the user or custodian accepts receipt. **NOTE:** Only authorized personnel will open or package containers of RAM or items.

A3.4.1. If the RAM is to be transported from SAFB, prepare for shipment and packaging per applicable Nuclear Regulatory Commission and DOT regulations. Contact the IRSO for assistance and shipping surveys.